

Example of LU factorization with pivoting.

$$\begin{array}{ccc}
 p = [1 \ 2 \ 3] \text{ swap} & p = [2 \ 1 \ 3] & p = [2 \ 1 \ 3] \\
 \quad \quad \quad 1 \ \& \ 2 & & \\
 \begin{array}{c} | 1 \ 3 \ 1 | \\ +-----+ \\ | 2 \ 4 \ 4 | \\ +-----+ \\ | 2 \ 6 \ 6 | \end{array} & \begin{array}{c} | 2 \ 4 \ 4 | \\ +-----+ \\ | 1 \ 3 \ 1 | \\ +-----+ \\ | 2 \ 6 \ 6 | \end{array} & \begin{array}{c} | 2 \ 4 \ 4 | \\ +-----+ \\ | \frac{1}{2} \ | \ 1 \ -1 | \\ +-----+ \\ | 1 \ | \ 2 \ 2 | \end{array}
 \end{array}$$

$$\begin{array}{cc}
 p = [2 \ 3 \ 1] & p = [2 \ 3 \ 1] \\
 \begin{array}{c} | 2 \ 4 \ 4 | \\ +-----+ \\ | 1 \ | \ 2 \ 2 | \\ +-----+ \\ | \frac{1}{2} \ | \ 1 \ -1 | \end{array} & \begin{array}{c} | 2 \ 4 \ 4 | \\ +-----+ \\ | 1 \ | \ 2 \ 2 | \\ +-----+ \\ | \frac{1}{2} \ | \ \frac{1}{2} \ | \ -2 | \end{array}
 \end{array}$$

$\frac{1}{2}$

